

# Health Risk Information for Public Health Goal Exceedance Reports

April 2007

Under the Calderon-Sher Safe Drinking Water Act of 1996 (the Act), water utilities are required to prepare a report every three years for contaminants that exceed public health goals (PHGs) (Health and Safety Code Section 116470 (2)[b]). The numerical health risk is to be presented with the category of health risk, along with a plainly worded description of these terms. PHGs are published by the Office of Environmental Health Hazard Assessment (OEHHA)(Health and Safety Code Section 116365) as concentrations of contaminants in drinking water that OEHHA, using current risk assessment principles, practices and methods, considers to pose no significant health risk if consumed for a lifetime. This report is prepared by OEHHA to assist the water utilities in meeting their requirements.

**Numerical health risks.** The tables that follow summarize health risks for chemical contaminants in drinking water that have PHGs and state and/or federal regulatory standards. The regulatory standards are maximum contaminant levels (MCLs). The Act also requires that OEHHA publish PHGs based on health risk assessments using the most current scientific methods. As defined in statute, PHGs for noncarcinogenic chemicals in drinking water are set at a concentration “at which no known or anticipated adverse health effects will occur, with an adequate margin of safety.” For carcinogens PHGs are set at a concentration that “does not pose any significant risk to health.” PHGs provide one basis for revising MCLs, along with cost and technological feasibility. OEHHA has been publishing PHGs as they are completed since 1997 and the entire list published to date is shown in Table 1.

The Act requires that for chemical contaminants with California MCLs that do not yet have PHGs, water utilities will use the federal maximum contaminant level goal (MCLG) for the purpose of complying with the requirement of public notification. MCLGs, like PHGs, are strictly health based and include a margin of safety. One difference, however, is that the MCLGs for carcinogens are set at zero because the United States Environmental Protection Agency (U.S. EPA) assumes there is no absolutely safe level of exposure to them. PHGs, on the other hand, are set at a level considered to pose no *significant* risk of cancer; this is usually a no more than one-in-a-million excess cancer risk ( $1 \times 10^{-6}$ ) level for a lifetime of exposure. Chemicals with MCLGs but no PHGs are presented in Table 2. The cancer risks shown are based on the U.S. EPA’s evaluations.

**Health risk categories.** The following information can be used for presenting the health risk categories in “exceedance reports.” The health risks shown in the tables are based on long-term exposures to low levels of contaminants as would occur with drinking water (unless otherwise stated), rather than high doses from a single or short-term exposure. The potential health effects are the most sensitive adverse effects that occur when chemical exposure reaches a sufficient level and duration to produce toxicity. Health goals that protect against these risks also protect against health risks that would occur from short-term exposures. For most health risk categories, the specific health outcome or the organ or system that is affected is also given. The health effects are given in nontechnical terms when possible, and the categories are described below.

*Acute toxicity* - adverse health effects that develop after a short-term exposure to a chemical (minutes to days).

*Subchronic toxicity* – adverse health effects that develop after repeated or longer-term exposures to a chemical (days to months).

*Carcinogenic* - capable of producing cancer.

*Chronic toxicity* - adverse effects that usually develop gradually from low levels of chemical exposure over a long period of time (months to years).

*Developmental toxicity* - adverse effects on the developing organism that may result from exposure prior to conception (either parent), during prenatal development, or postnatally to the time of sexual maturation. Adverse developmental effects may be detected at any point in the life span of the organism. The major manifestations include: (1) death of the developing organism, (2) structural abnormality (birth defects), (3) altered growth, and (4) functional deficiency.

*Neurotoxic* - capable of adversely affecting or destroying parts of the nervous system or interfering with nerve signal transmission. Effects may be reversible (for example, effects on chemicals that carry nerve signals across gaps between nerve cells) or irreversible (for example, destruction of nerve cells).

*Reproductive effects* - the occurrence of adverse effects on the reproductive system of females or males that may result from exposure to environmental agents. The toxicity may cause changes to the female or male reproductive organs, the regulating endocrine system, or pregnancy outcomes. Examples of such toxicity may include adverse effects on onset of puberty, egg production and transport, menstrual cycle normality, sexual behavior such as sexual urge, lowered fertility, sperm production, length of pregnancy, and milk production.

The tables further note whether the health risk category is based on human or animal data. Data on health effects of toxic substances are usually obtained from studies on laboratory animals.

**For more information on health risks:** The adverse health effects for each chemical with a PHG are summarized in each PHG technical support document. These documents are available on the OEHHA Web site (<http://www.oehha.ca.gov>). Also, U.S. EPA has consumer and technical fact sheets on most of the chemicals having MCLs. For copies of the fact sheets, call

the Safe Drinking Water Hotline at 1-800-426-4791, or explore the U.S. EPA Office of Ground Water and Drinking Water's home page at <http://www.epa.gov/OGWDW/hfacts.html>.

**Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)**

<b>Chemical</b>	<b>Health Risk Category<sup>1</sup> (more specific information in parentheses)</b>	<b>California PHG (mg/L)<sup>2</sup></b>	<b>Cancer Risk<sup>3</sup> @ PHG</b>	<b>California MCL<sup>4</sup> (mg/L)</b>	<b>Cancer Risk @ California MCL</b>
Alachlor	carcinogenicity (cancer)	0.004 <sup>5</sup>	NA <sup>6</sup>	0.002	NA
Aluminum	chronic toxicity (increased serum aluminum level) (human data)	0.6	NA	1	NA
Antimony	chronic toxicity (shortened lifespan)	0.02	NA	0.006	NA
Arsenic	carcinogenicity (cancer)	0.000004 (4x10 <sup>-6</sup> )	1 x 10 <sup>-6</sup> (one per million)	0.05 (federal MCL 0.01)	0.01 (1 in a hundred)
Asbestos	carcinogenicity (cancer)	7 MFL (fibers >10 microns in length)	1 x 10 <sup>-6</sup>	7 MFL <sup>7</sup> (fibers >10 microns in length)	1x10 <sup>-6</sup>
Atrazine	carcinogenicity (cancer)	0.00015	1x10 <sup>-6</sup>	0.001	7x10 <sup>-6</sup> (seven per million)

<sup>1</sup> Health risk category based on experimental animal testing data evaluated in the OEHHA PHG technical support document unless otherwise specified.

<sup>2</sup> mg/L = milligrams per liter of water or parts per million (ppm) (PHGs are expressed here in milligrams per liter for consistency with the typical unit used for MCLs and MCLGs.)

<sup>3</sup> Cancer Risk = theoretical 70-year lifetime excess cancer risk at the statistical upper confidence limit. Actual cancer risk may be lower or zero. Cancer risk is stated in terms of excess cancer cases per million (or fewer) population, e.g., 1x10<sup>-6</sup> means one excess cancer case per million people; 5x10<sup>-5</sup> means five excess cancer cases per 100,000 people.

<sup>4</sup> MCL = maximum contaminant level.

<sup>5</sup> Non-linear approach used for alachlor risk assessment, no cancer risk assumed at the PHG level.

<sup>6</sup> NA = not applicable. Noncarcinogenic, or a cancer risk cannot be calculated. The PHG for these chemicals is set at a level that is believed to be without any significant public health risk to individuals exposed to that chemical over a lifetime.

<sup>7</sup> MFL = million fibers per liter.

**Table 1: Health Risk Categories and Cancer Risk Values for Chemicals  
with California Public Health Goals (PHGs)**

<b>Chemical</b>	<b>Health Risk Category<sup>1</sup> (more specific information in parentheses)</b>	<b>California PHG (mg/L)<sup>2</sup></b>	<b>Cancer Risk<sup>3</sup> @ PHG</b>	<b>California MCL<sup>4</sup> (mg/L)</b>	<b>Cancer Risk @ California MCL</b>
Barium	chronic toxicity (hypertension)	2	NA	1	NA
Bentazon	chronic toxicity (clinical, body weight, liver and intestinal effects)	0.2	NA	0.018	NA
Benzene	carcinogenicity (leukemia)	0.00015	$1 \times 10^{-6}$	0.001	$7 \times 10^{-6}$
Benzo[a]pyrene	carcinogenicity (cancer)	0.000004	$1 \times 10^{-6}$	0.0002	$5 \times 10^{-5}$
Beryllium	chronic toxicity (gastrointestinal lesions)	0.001	NA	0.004	NA
Cadmium	chronic toxicity (kidney effects, human data)	0.00004	NA	0.005	NA
Carbofuran	chronic toxicity (enzyme inhibition, blood chemistry and testis effects)	0.0017	NA	0.018	NA
Carbon tetrachloride	carcinogenicity (cancer)	0.0001	$1 \times 10^{-6}$	0.0005	$5 \times 10^{-6}$
Chlordane	carcinogenicity (cancer)	0.00003	$1 \times 10^{-6}$	0.0001	$3 \times 10^{-6}$
Copper	acute toxicity (gastrointestinal effects in children, human data)	0.17	NA	1.3 (AL) <sup>8</sup>	NA

<sup>8</sup> AL = action level.

**Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)**

<b>Chemical</b>	<b>Health Risk Category<sup>1</sup> (more specific information in parentheses)</b>	<b>California PHG (mg/L)<sup>2</sup></b>	<b>Cancer Risk<sup>3</sup> @ PHG</b>	<b>California MCL<sup>4</sup> (mg/L)</b>	<b>Cancer Risk @ California MCL</b>
Cyanide	chronic toxicity <sup>9</sup> (no clinical and histopathological effects observed)	0.15	NA	0.15	NA
Dalapon	chronic toxicity (kidney effects)	0.79	NA	0.2	NA
1,2-Dibromo-3-chloropropane (DBCP)	carcinogenicity (cancer)	0.0000017 (1.7x10 <sup>-6</sup> )	1x10 <sup>-6</sup>	0.0002	1x10 <sup>-4</sup>
1,2-Dichloro-benzene (o-DCB)	chronic toxicity (liver effects)	0.6	NA	0.6	NA
1,4-Dichloro-benzene (p-DCB)	carcinogenicity (cancer)	0.006	1x10 <sup>-6</sup>	0.005	8x10 <sup>-7</sup>
1,1-Dichloroethane (1,1-DCA)	carcinogenicity (cancer)	0.003	1x10 <sup>-6</sup>	0.005	2x10 <sup>-6</sup>
1,2-Dichloroethane (1,2-DCA)	carcinogenicity (cancer)	0.0004	1x10 <sup>-6</sup>	0.0005	1x10 <sup>-6</sup>
1,1-Dichloro-ethylene (1,1-DCE)	chronic toxicity (liver effects)	0.01	NA	0.006	NA
1,2-Dichloro-ethylene, cis	Subchronic toxicity (kidney effects)	0.1	NA	0.006	NA
1,2-Dichloro-ethylene, trans	Subchronic toxicity (liver effects)	0.06	NA	0.01	NA

<sup>9</sup> Cyanide: Acute toxicity of concern is respiratory arrest. Long-term exposure allows for detoxification.

**Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)**

<b>Chemical</b>	<b>Health Risk Category<sup>1</sup> (more specific information in parentheses)</b>	<b>California PHG (mg/L)<sup>2</sup></b>	<b>Cancer Risk<sup>3</sup> @ PHG</b>	<b>California MCL<sup>4</sup> (mg/L)</b>	<b>Cancer Risk @ California MCL</b>
Dichloromethane (methylene chloride)	carcinogenicity (cancer)	0.004	$1 \times 10^{-6}$	0.005	$1 \times 10^{-6}$
2,4-Dichlorophenoxyacetic acid (2,4-D)	chronic toxicity (liver and kidney effects)	0.07	NA	0.07	NA
1,2-Dichloropropane (propylene dichloride)	carcinogenicity (cancer)	0.0005	$1 \times 10^{-6}$	0.005	$1 \times 10^{-5}$
1,3-Dichloropropene (Telone II®)	carcinogenicity (cancer)	0.0002	$1 \times 10^{-6}$	0.0005	$2 \times 10^{-6}$
Di(2-ethylhexyl) adipate (DEHA)	developmental toxicity (disrupted development)	0.2	NA	0.4	NA
Diethylhexyl-phthalate (DEHP)	carcinogenicity (cancer)	0.012	$1 \times 10^{-6}$	0.004	$3 \times 10^{-7}$
Dinoseb	reproductive toxicity (uterus and testis effects)	0.014	NA	0.007	NA
Diquat	chronic toxicity (eye effects) and developmental toxicity (malformation)	0.015	NA	0.02	NA
Endothall	chronic toxicity (stomach effects)	0.58	NA	0.1	NA
Endrin	chronic toxicity (liver effects) and neurotoxicity (convulsions)	0.0018	NA	0.002	NA

**Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)**

<b>Chemical</b>	<b>Health Risk Category<sup>1</sup> (more specific information in parentheses)</b>	<b>California PHG (mg/L)<sup>2</sup></b>	<b>Cancer Risk<sup>3</sup> @ PHG</b>	<b>California MCL<sup>4</sup> (mg/L)</b>	<b>Cancer Risk @ California MCL</b>
Ethylbenzene (phenylethane)	chronic toxicity (liver effects)	0.3	NA	0.3	NA
Ethylene dibromide	carcinogenicity (cancer)	0.00001	$1 \times 10^{-6}$	0.00005	$5 \times 10^{-6}$
Fluoride	chronic toxicity (tooth mottling, human data)	1	NA	2	NA
Glyphosate	chronic toxicity (kidney effects)	1	NA	0.7	NA
Heptachlor	carcinogenicity (cancer)	0.000008	$1 \times 10^{-6}$	0.00001	$1 \times 10^{-6}$
Heptachlor epoxide	carcinogenicity (cancer)	0.000006	$1 \times 10^{-6}$	0.00001	$2 \times 10^{-6}$
Hexachlorobenzene	carcinogenicity (cancer)	0.00003	$1 \times 10^{-6}$	0.001	$3 \times 10^{-5}$
Hexachlorocyclopentadiene (HEX)	chronic toxicity (stomach lesions)	0.05	NA	0.05	NA
Lead	chronic toxicity (neurobehavioral effects in children, hypertension in adults) and carcinogenicity (cancer)	0.002	$3 \times 10^{-7}$ (PHG is not based on this effect)	0.015 (AL)	$2 \times 10^{-6}$
Lindane ( $\gamma$ -BHC)	carcinogenicity (cancer)	0.000032	$1 \times 10^{-6}$	0.0002	$6 \times 10^{-6}$
Monochlorobenzene (chlorobenzene)	subchronic toxicity (liver damage)	0.2	NA	0.07	NA
Mercury (inorganic)	chronic toxicity (kidney effects)	0.0012	NA	0.002	NA



**Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)**

<b>Chemical</b>	<b>Health Risk Category<sup>1</sup> (more specific information in parentheses)</b>	<b>California PHG (mg/L)<sup>2</sup></b>	<b>Cancer Risk<sup>3</sup> @ PHG</b>	<b>California MCL<sup>4</sup> (mg/L)</b>	<b>Cancer Risk @ California MCL</b>
Methoxychlor	reproductive toxicity (vagina, ovary, uterus and hormonal effects)	0.03	NA	0.03	NA
Methyl tertiary-butyl ether (MTBE)	carcinogenicity (cancer)	0.013	$1 \times 10^{-6}$	0.013	$1 \times 10^{-6}$
Nickel	developmental toxicity (increased neonatal deaths)	0.012	NA	0.1	NA
Nitrate	acute toxicity (methemoglobinemia, human data)	10 as nitrate-nitrogen	NA	45 as NO <sub>3</sub>	NA
Nitrite	acute toxicity (methemoglobinemia, human data)	1 as nitrite-nitrogen	NA	1 as nitrite-nitrogen	NA
Nitrate and Nitrite	acute toxicity (methemoglobinemia, human data)	10 as nitrogen	NA	10 as nitrogen	NA
N-nitrosodimethylamine (NDMA)	carcinogenicity (cancer)	0.000003	$1 \times 10^{-6}$	---	---
Oxamyl	chronic toxicity (body weight effects)	0.05	NA	0.05	NA
Pentachlorophenol (PCP)	carcinogenicity (cancer)	0.0004	$1 \times 10^{-6}$	0.001	$3 \times 10^{-6}$
Perchlorate	subchronic toxicity (thyroid and reproductive effects)	0.006	NA	---	NA
Picloram	chronic toxicity (liver effects)	0.5	NA	0.5	NA

**Table 1: Health Risk Categories and Cancer Risk Values for Chemicals  
with California Public Health Goals (PHGs)**

<b>Chemical</b>	<b>Health Risk Category<sup>1</sup> (more specific information in parentheses)</b>	<b>California PHG (mg/L)<sup>2</sup></b>	<b>Cancer Risk<sup>3</sup> @ PHG</b>	<b>California MCL<sup>4</sup> (mg/L)</b>	<b>Cancer Risk @ California MCL</b>
Radium-226	carcinogenicity (cancer)	0.05 pCi/L	$1 \times 10^{-6}$	5 pCi/L	$1 \times 10^{-4}$
Radium-228	carcinogenicity (cancer)	0.019 pCi/L	$1 \times 10^{-6}$	5 pCi/L (combined Ra <sup>226+228</sup> )	$3 \times 10^{-4}$
Silvex (2,4,5-TP)	chronic toxicity (liver effects)	0.025	NA	0.05	NA
Simazine	chronic toxicity (reduced body weight)	0.004	NA	0.004	NA
Strontium-90	carcinogenicity (cancer)	0.35 pCi/L	$1 \times 10^{-6}$	8 pCi/L	$2 \times 10^{-5}$
1,1,2,2- Tetrachloroethane	carcinogenicity (cancer)	0.0001	$1 \times 10^{-6}$	0.001	$1 \times 10^{-5}$
Tetrachloroethylene (perchloroethylene, or PCE)	carcinogenicity (cancer)	0.00006	$1 \times 10^{-6}$	0.005	$8 \times 10^{-5}$
Thallium	subchronic toxicity (hair loss)	0.0001	NA	0.002	NA
Thiobencarb	chronic toxicity (body weight, food efficiency and enzyme activity effects)	0.07	NA	0.07	NA
Toluene (methylbenzene)	chronic toxicity (liver and thymus effects)	0.15	NA	0.15	NA
Toxaphene	carcinogenicity (cancer)	0.00003	$1 \times 10^{-6}$	0.003	$1 \times 10^{-4}$
1,2,4-Trichloro- benzene (Unsym-TCB)	chronic toxicity (effects on adrenal glands)	0.005	NA	0.005	NA

**Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)**

<b>Chemical</b>	<b>Health Risk Category<sup>1</sup> (more specific information in parentheses)</b>	<b>California PHG (mg/L)<sup>2</sup></b>	<b>Cancer Risk<sup>3</sup> @ PHG</b>	<b>California MCL<sup>4</sup> (mg/L)</b>	<b>Cancer Risk @ California MCL</b>
1,1,1-Trichloroethane	neurotoxicity (structural changes), reproductive toxicity (fewer offspring), chronic toxicity (liver and blood effects)	1	NA	0.2	NA
1,1,2-Trichloroethane	carcinogenicity (cancer)	0.0003	$1 \times 10^{-6}$	0.005	$2 \times 10^{-5}$
1,1,2-Trichloroethylene (TCE)	carcinogenicity (cancer)	0.0008	$1 \times 10^{-6}$	0.005	$6 \times 10^{-6}$
Trichlorofluoromethane (Freon 11)	chronic toxicity (liver effects)	0.7	NA	0.15	NA
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	chronic toxicity (liver effects)	4	NA	1.2	NA
Tritium	carcinogenicity (cancer)	400 pCi/L	$1 \times 10^{-6}$	20,000 pCi/L	$5 \times 10^{-5}$
Uranium	carcinogenicity (cancer)	0.43 pCi/L	$1 \times 10^{-6}$	20 pCi/L	$5 \times 10^{-5}$
Vinyl chloride	carcinogenicity (cancer)	0.00005	$1 \times 10^{-6}$	0.0005	$1 \times 10^{-5}$
Xylenes	neurotoxicity (effects on senses, mood and motor control, human data)	1.8 (single isomer or sum of isomers)	NA	1.75 (single isomer or sum of isomers)	NA

**Table 2: Health Risk Categories and Cancer Risk Values for Chemicals  
without California Public Health Goals**

<b>Chemical</b>	<b>Health Risk Category<sup>1</sup> (more specific information in parentheses)</b>	<b>U.S. EPA MCLG<sup>2</sup> (mg/L)</b>	<b>Cancer Risk<sup>3</sup> @ MCLG</b>	<b>California MCL<sup>4</sup> (mg/L)</b>	<b>Cancer Risk @ California MCL</b>
Chromium	chronic toxicity (stomach, liver effects), immunotoxicity (allergic dermatitis)	0.1	NA	0.05	NA
Dioxin (2,3,7,8-TCDD)	carcinogenicity (cancer) reproductive effects	0	0	0.00000003	$1 \times 10^{-5}$
Molinate	reproductive effects (decreased number of offspring)	none	NA	0.02	NA
Polychlorinated biphenyls (PCBs)	carcinogenicity (cancer)	0	0	0.0005	$1 \times 10^{-4}$
Selenium	chronic toxicity (hair and nail changes, skin lesions, blood effects; human data) and neurotoxicity	0.05	NA	0.05	NA
Styrene (vinylbenzene)	chronic toxicity (liver, kidney and blood effects)	0.1	NA	0.1	NA
<b>Disinfection byproducts (DBPS)</b>					
bromate	carcinogenicity (cancer)	0	0	0.01	NA

<sup>1</sup> Health risk category based on experimental animal testing data evaluated in the U.S. EPA MCLG document or California MCL document unless otherwise specified.

<sup>2</sup> MCLG = maximum contaminant level goal established by U.S. EPA.

<sup>3</sup> Cancer Risk = theoretical 70-year lifetime excess cancer risk at the statistical confidence limit. Actual cancer risk may be lower or zero. Cancer risk is stated in terms of excess cancer cases per million (or fewer) population, e.g.,  $1 \times 10^{-6}$  means one excess cancer case per million people;  $5 \times 10^{-5}$  means five excess cancer cases per 100,000 people.

<sup>4</sup> California MCL = maximum contaminant level established by California.

**Table 2: Health Risk Categories and Cancer Risk Values for Chemicals  
without California Public Health Goals**

<b>Chemical</b>	<b>Health Risk Category<sup>1</sup> (more specific information in parentheses)</b>	<b>U.S. EPA MCLG<sup>2</sup> (mg/L)</b>	<b>Cancer Risk<sup>3</sup> @ MCLG</b>	<b>California MCL<sup>4</sup> (mg/L)</b>	<b>Cancer Risk @ California MCL</b>
chloramines	acute toxicity (irritation) and chronic toxicity (stomach effects, anemia)	4 <sup>5</sup>	NA	none	NA
chlorine	acute toxicity (irritation) and chronic toxicity (stomach effects)	4 <sup>5</sup>	NA	none	NA
chlorine dioxide	chronic toxicity (anemia) and neurotoxicity (infants and young children, human data)	0.8 <sup>5</sup>	NA	none	NA
chlorite	chronic toxicity (anemia) and neurotoxicity (infants and children, human data)	0.8	NA	1.0	NA
<b>Disinfection byproducts: haloacetic acids (HAA5)</b>					
chloroacetic acid	chronic toxicity (body and organ weight changes)	0.07	NA	none	NA
dichloroacetic acid	carcinogenicity (cancer)	0	0	none	NA
trichloroacetic acid	chronic toxicity (liver effects)	0.02	0	none	NA
bromoacetic acid	NA	none	NA	none	NA
dibromoacetic acid	NA	none	NA	none	NA
total haloacetic acids	carcinogenicity (cancer)	none	NA	0.06	NA
<b>Disinfection byproducts: trihalomethanes (THMS)</b>					

<sup>5</sup> Maximum Residual Disinfectant Level Goal, or MRDLG

**Table 2: Health Risk Categories and Cancer Risk Values for Chemicals  
without California Public Health Goals**

<b>Chemical</b>	<b>Health Risk Category<sup>1</sup> (more specific information in parentheses)</b>	<b>U.S. EPA MCLG<sup>2</sup> (mg/L)</b>	<b>Cancer Risk<sup>3</sup> @ MCLG</b>	<b>California MCL<sup>4</sup> (mg/L)</b>	<b>Cancer Risk @ California MCL</b>
bromodichloro- methane (BDCM)	carcinogenicity (cancer)	0	0	none	NA
bromoform	carcinogenicity (cancer)	0	0	none	NA
chloroform	chronic toxicity (liver and kidney effects)	0.07	NA	none	NA
dibromo- chloromethane (DBCM)	chronic toxicity (liver and kidney effects) and neurotoxicity	0.06	NA	none	NA
total (sum of BDCM, bromoform, chloroform and DBCM)	carcinogenicity (cancer), chronic toxicity (liver and kidney effects), and neurotoxicity	none	NA	0.08	NA
<b>Radionuclides</b>					
gross alpha particles <sup>6</sup>	carcinogenicity (cancer)	0 (as of 12/08/2003) ( <sup>210</sup> Po included)	0	15 pCi/L <sup>7</sup> (includes <sup>226</sup> Ra but not radon and uranium)	up to 1x10 <sup>-3</sup> (for <sup>210</sup> Po, the most potent alpha emitter)
beta particles and photon emitters <sup>6</sup>	carcinogenicity (cancer)	0 (as of 12/08/2003) ( <sup>210</sup> Pb included)	0	50 pCi/L	up to 2x10 <sup>-3</sup> (for <sup>210</sup> Pb, the most potent beta- emitter)

<sup>6</sup> MCLs for gross alpha and beta are screening standards for a group of radionuclides. A corresponding PHG was considered inappropriate because risks vary for the individual radionuclides covered by the screening level; see OEHHA memoranda discussing the cancer risks at these MCLs at <http://www.oehha.ca.gov/water/phg/index.html>.

<sup>7</sup> pCi/L = picocuries per liter of water.